

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A hydrogen permeation membrane comprising: a niobium alloy with 5-25 wt.% of at least one element from the group consisting of ~~palladium~~, ruthenium, rhenium, ~~platinum~~, ~~gold~~, and rhodium.

2. (Original) A hydrogen permeation membrane according to Claim 1, and further comprising at least one of zirconium and hafnium.

3. (Original) A hydrogen permeation membrane according to Claim 1, wherein the alloy has 0.5-3.0 wt.% of zirconium and 10-20 wt.% of palladium.

4. (Original) A process for producing a hydrogen permeation membrane, comprising the steps of:

applying at least one coating of at least one element from the group consisting of palladium, ruthenium, rhenium, platinum, gold, rhodium, zirconium, and hafnium on a substrate of one of niobium and a niobium alloy with at least one element from the group consisting of palladium, ruthenium, rhenium, platinum, gold, and rhodium to form a composite; and
subjecting the composite to a diffusion heat treatment.

5. (Original) A process according to Claim 4, including applying the coating one of by the PVD process, by chemical deposition, by electrodeposition, and by mechanical plating.

6. (Original) A fuel cell comprising a hydrogen permeation membrane consisting of niobium alloy with 5-25 wt.% of at least one element from the group consisting of palladium, ruthenium, rhenium, platinum, gold, and rhodium.

7. (Currently Amended) A fuel cell having a hydrogen permeation membrane ~~for a fuel cell~~, produced by:

applying at least one coating of at least one element from the group consisting of palladium, ruthenium, rhenium, platinum, gold, rhodium, zirconium, and hafnium on a substrate of one of niobium and a niobium alloy with at least one element from the group consisting of palladium, ruthenium, rhenium, platinum, gold, and rhodium to form a composite; and

subjecting the composite to a diffusion heat treatment.

8. (New) A hydrogen permeation membrane comprising: a niobium alloy with 5-25 wt.% of at least one element from the group consisting of palladium, ruthenium, rhenium, platinum, gold, and rhodium; and at least one of zirconium and hafnium.